

## Claims

- [c1] 1. A serial-protocol panel display system, suitable for use in a panel display apparatus, comprising:
  - a pixel-array unit;
  - a plurality of drivers, used for driving the pixel-array unit to display image; and
  - a video graphic adapter (VGA) unit, according to a serial protocol, to export a serial-protocol image display signal and a clock signal to a corresponding one of the drivers, wherein the drivers decode the serial-protocol image display signal, so as to obtain a plurality of input signals, and to drive pixels of the pixel-array unit.
- [c2] 2. The serial-protocol panel display system of claim 1, further comprising a connector, coupled between the VGA unit and the drivers.
- [c3] 3. The serial-protocol panel display system of claim 1, further comprising a gamma correction unit, to provide color management information to a portion of the drives.
- [c4] 4. The serial-protocol panel display system of claim 1, further comprising a power source unit, to provide a plurality of voltage levels for use in the panel display

system.

- [c5] 5. The serial-protocol panel display system of claim 1, wherein the drivers include source drivers and gate drivers.
- [c6] 6. The serial-protocol panel display system of claim 5, each of the source drivers includes:
  - a source input interface, receiving the serial-protocol image display signal exported from the VGA unit and the clock signal, wherein the serial-protocol image display signal and the clock signal are continuously transmitted to a next one of the source drivers, and are used for decoding out a plurality of source input signals in the input signals; and
  - a state-in-the-art source driver, respectively receiving the source input signals.
- [c7] 7. The serial-protocol panel display system of claim 6, wherein the source input interface comprises:
  - a decoding unit, according to the serial-protocol image display signal and the clock signal, decoding into the source input signals and exporting to the state-in-the-art source driver; and
  - a switch unit, passing the serial-protocol image display signal and the clock signal to the next one of the source drivers, and coupled with the decoding unit for export-

ing a decoded color information and the clock signal to the state-in-the-art source driver.

- [c8] 8. The serial-protocol panel display system of claim 6, wherein the serial-protocol image display signal includes color signals of red, green, and blue.
- [c9] 9. The serial-protocol panel display system of claim 5, wherein each of the gate drivers includes:
  - a gate input interface, receiving at least a portion of the serial-protocol image display signal exported from the VGA unit and the clock signal, wherein the serial-protocol image display signal and the clock signal are continuously transmitted to a next one of the gate drivers, and are used for decoding out a plurality of gate input signals in the input signals; and
  - a state-in-the-art gate driver, respectively receiving the gate input signals.
- [c10] 10. The serial-protocol panel display system of claim 9, wherein the serial-protocol image display signal includes color signals of red, green, and blue.
- [c11] 11. The serial-protocol panel display system of claim 10, wherein the gate input interface includes:
  - a decoding unit, according to the serial-protocol image display signal and the clock signal, decoding into the

gate input signals and exporting to the state-in-the-art gate driver; and

a switch unit, passing the serial-protocol image display signal and the clock signal to the next one of the gate drivers, and coupled with the decoding unit for exporting a clock signal to the state-in-the-art gate driver.

- [c12] 12. The serial-protocol panel display system of claim 1, wherein the VGA unit includes:
  - a VGA chip; and
  - a protocol encoder, coupled with the VGA chip for encoding, and exporting the serial-protocol image display signal and clock signal.
- [c13] 13. A source driver, suitable for use in a panel display apparatus to drive corresponding pixels, comprising:
  - a source input interface, receiving a serial-protocol image display signal and a clock signal, wherein the serial-protocol image display signal and the clock signal are continuously transmitted to a next one of the source driver, and are used for decoding out a plurality of source input signals; and
  - a state-in-the-art source driver, respectively receiving the source input signals.
- [c14] 14. The source driver of claim 13, wherein the source input interface includes:

a decoding unit, according to the serial-protocol image display signal and the clock signal, decoding into the source input signals and exporting to the state-in-the-art source driver; and  
a switch unit, passing the serial-protocol image display signal and the clock signal to the next one of the source driver, and coupled with the decoding unit for exporting a decoded color information and the clock signal to the state-in-the-art source driver.

- [c15] 15. A gate driver, suitable for use in a panel display apparatus to drive corresponding pixels, comprising:  
a gate input interface, receiving a serial-protocol image display signal and a clock signal, wherein the serial-protocol image display signal and the clock signal are continuously transmitted to a next one of the gate driver, and are used for decoding out a plurality of gate input signals; and  
a state-in-the-art gate driver, respectively receiving the gate input signals.
- [c16] 16. The gate driver of claim 15, wherein the gate input interface includes:  
a decoding unit, according to the serial-protocol image display signal and the clock signal, decoding into the gate input signals and exporting to the state-in-the-art source driver; and

a switch unit, passing the serial-protocol image display signal and the clock signal to the next one of the gate driver, and coupled with the decoding unit for exporting the clock signal to the state-in-the-art gate driver.

- [c17] 17. A video graphic adapter (VGA), suitable for use in a panel display apparatus to receive image control signals, comprising:
  - a VGA chip, for receiving an image control signal; and
  - a protocol decoder, coupled with the VGA chip for encoding, and exporting a serial-protocol image display signal and a clock signal.
- [c18] 18. A serial-protocol panel display method, comprising:
  - receiving an image control signal and a clock signal;
  - encoding the image control signal into a serial-protocol image display signal, according to a serial protocol;
  - sequentially transmitting the serial-protocol image display signal and the clock signal to a plurality of first drivers;
  - sequentially transmitting at least a portion of the serial-protocol image display signal and the clock signal to a plurality of second drivers;
  - decoding the serial-protocol image display signal into a first set of control signals and a color information in each of the first drivers, used for pixel display;
  - decoding the serial-protocol image display signal into a

**second set of control signals in each of the second drivers; and driving the corresponding pixels, according to the first set of control signals, the second set of control signal, and the color information.**